Female Sexual Dysfunction

Female sexual dysfunction (FSD) is a subjective dissatisfaction, leading to significant distress, with the level or nature of sexual activity. Definitions have continued to change since they were first attempted in 1998.

Definitions of female sexual dysfunction [1, 2, 3, 4]

The Diagnosis and Statistical Manual of Mental Disorders fifth edition (DSM-5) classifies FSD into three clinically significant types: For each diagnosis the disorder is experienced at least 75% of the time for at least six months (except for medication-induced FSD), resulting in significant distress. FSD can be lifelong or acquired, and generalised or situational. Exclusion criteria include nonsexual mental disorder, severe relationship distress (eg, partner violence) and other significant stressors. The three types, some or all of which may be present, are:

- **Sexual interest/arousal disorder**. This is defined as reduced or absent sexual interest, responsiveness, erotic thoughts and sexual pleasure.
- **Female orgasmic disorder** (absence, infrequency, reduction, delay of orgasm):
    - Lifelong anorgasmia may suggest unfamiliarity or discomfort with self-stimulation or sexual communication with her partner.
    - Delayed or less intense orgasms may be a natural process of ageing, due to decreased genital blood flow, atrophy and reduction in sensitivity.

- **Genito-pelvic pain/penetration disorder** (difficulty in vaginal penetration, marked vulvovaginal or pelvic pain during penetration, fear or anxiety about pain in anticipation of, during, or after penetration, and tightening or tensing of pelvic floor muscles during attempted penetration):
    - Genito-pelvic pain/penetration disorder includes fear or anxiety, marked tightening or tensing of the abdominal and pelvic muscles, or actual pain associated with attempts toward vaginal penetration that is persistent or recurrent for at least six months.

The older International Classification of Diseases tenth edition (ICD-10) definitions focus more closely on physical factors, defining FSD as a recurrent or persistent inability to attain or maintain (until completion of sexual activity) an adequate physical response of sexual excitement, consisting of vaso-congestion in the pelvis, vaginal lubrication and expansion, and swelling of the external genitalia. ICD-10 has been criticised for the use of objective measures as a proxy for subjective measures with which they do not clearly correlate. In a study of 401 consecutive women attendees in general practice:

- 18% were assigned an ICD-10 diagnosis and agreed that they had a problem.
- 20% were assigned a diagnosis but reported no problem.
- 19% had no diagnosis but reported a sexual problem.
- 42% had no diagnosis and reported no problem.

History of the diagnosis

The first classification for FSD was set up in 1998, based on the Masters and Johnson model of four-phase sexual response, consisting of excitement, plateau, orgasm and resolution [5]. It classified female sexual dysfunction in terms of disorders of desire, arousal or orgasm, with a fourth category of pain associated with normal sexual intercourse. This approach suggested a linear progress of satisfactory sexual experience in women paralleling that in men, but in fact the female sexual response cycle is non-linear, consisting of independent, overlapping phases in a variable sequence. The correlation seen in men between arousal and erection (which may occur when the man does not wish to become aroused) is not absolutely paralleled in women, where desire and arousal are not necessarily sequential, and low desire does not preclude arousal. Psychological factors are highly significant drivers of female sexual response. They include emotional intimacy, well-being and lack of negative effects from sexual avoidance.

Epidemiology [4, 6]

Definitions of FSD are largely qualitative, and the condition is likely to be under-reported.

- FSD has been estimated to affect 40% of all women.
- Among postmenopausal women it has been self-reported in up to 87%.
- The prevalence of female sexual arousal disorders correlates significantly with increasing age.
- Sexual arousal and frequency of coitus in women decreases with increasing age.

Normal female sexual function [7]

It is impossible to define a 'normal' in this context. FSD is not a pathology, although pathology may underlie it:

- Sexual response is a response rather than an innate condition.

- Women differ in the stimuli needed to trigger the experiences that we label as desire and arousal.
- The physical responses of the body are highly variable, influenced not only by physical health and well-being but also by experience, expectation, culture, morality, novelty versus familiarity, and predictability versus uncertainty.
- The individual's ability to attend to, and respond to, sexual stimuli is influenced by emotional and psychological factors (such as intimacy, well-being, body image, environmental distractions) as well as multiple physical factors. This 'appraisal' of stimulus, and the subsequent response, involves numerous neurotransmitters, modulated by, and interacting with, sex hormones. It involves brain, spinal cord and peripheral tissues.

This means that, in most cases of FSD there will be no single, simple problem and solution. There may, however, be predominating factors that can be moderated in order to improve things for the better.

Pathophysiology[8]

Female sexual function involves hormonal, neurological, vascular, psychological and emotional aspects. Dysfunction may be triggered or maintained by any of these, or by the interplay between them. Female sexual function is also highly dependent on physical and psychological feedback, so that physical, emotional and psychological factors will affect one another, so that an original issue becomes clouded by others.

Hormonal factors[9, 10]

Hormones are involved in the sexual response, particularly in terms of the integrity and sensitivity of genital tissues. The menopause brings with it reduction in blood flow, clitoral shrinkage and reduction in sensitivity and it seems likely that there is a minimal hormonal 'milieu' beneath which female sexual function will be negatively affected. However, precisely what that milieu is, and whether (or not) attempting to correct it with exogenous hormone therapy adequately reverses all these changes, is not established beyond doubt.

Androgens[11]: evidence suggests androgens are important in female sexual function but the full role of testosterone in female physiology is not well understood. There is no blood androgen level below which women can be classified as having androgen deficiency, although it is clear that androgens do affect clitoral size and sensitivity and can at higher levels influence libido and arousal.

Oestrogens/progesterone[12]: oestrogen insufficiency is associated with urogenital atrophy. This is likely to increase the possibility of associated discomfort, whilst reducing the likelihood of orgasm.

Endocrine conditions[13, 14, 15]

Endocrine conditions which may affect sexual function include:

- Thyroid disease (both hyperthyroidism and hypothyroidism).
- Type 1 diabetes mellitus[14]. Type 1 diabetes has a strong association with FSD.
- Type 2 diabetes mellitus[15]. Type 2 diabetes is particularly associated with disorders of arousal. Prevalence is highest amongst patients who also complain of depression.
- Women with Addison's disease have low levels of circulating androgens but, perhaps surprisingly, have not been found to report higher levels of FSD[16].
- Polycystic ovary syndrome, obesity and metabolic syndrome could be associated with FSD but data are limited[9].

Pregnancy[17]

The prevalence of FSD among pregnant women is reported in 50-80% of women, mainly in the first and third trimesters. Contributory factors are physical and hormonal changes, perceived loss of attractiveness, concerns about the baby, breast tenderness and vaginal dryness. Vulval discomfort may occur due to varicosities during pregnancy, and following delivery. For some women FSD resolves in the second trimester when the initial discomfort of the first trimester may have passed, and there can be an increase in libido and sexual pleasure.

Sexual dysfunction in the postpartum period[18]

Irrespective of the type of delivery, short-term postpartum sexual changes, such as dyspareunia and loss of desire, are highly prevalent in postpartum women. Assisted vaginal delivery is associated with increased risk of postpartum sexual dysfunction. Perineal trauma and operative vaginal delivery are associated with increasing severity and incidence of dyspareunia.

Cardiovascular disease[18, 19]

Cardiovascular disease (CVD) is associated with an increased prevalence of FSD. Atherosclerosis affecting the hypogastric/pudendal arterial bed decreases the blood flow to the clitoris and vagina; this is called clitoral vascular insufficiency syndrome. Decreased blood flow can result in the loss of corporal smooth muscle in the vagina and clitoris, followed by fibrosis.

Sexual dysfunction, like erectile dysfunction in men, is related to the severity of CVD. CVD has an effect on arousal/desire, sensitivity of the clitoris and vaginal labia, and orgasm. Women with heart failure are particularly prone to experience problems with vaginal lubrication and many report moderate to severe sexual pain.

Neurological factors[6]

Sexual desire/arousal and orgasm are mediated by central and spinal nerve pathways and involve sympathetic, parasympathetic and somatic nerve activity. Neurological conditions can therefore interfere with female sexual function. These include central conditions such as Parkinson's disease and stroke, spinal cord lesions, and peripheral conditions such as diabetic autonomic neuropathy and aortic aneurysm affecting the pelvic nerve plexuses.

Pelvic surgery[18]

The pelvic autonomic nerves are essential for normal sexual function. The sympathetic fibres arise over the sacral promontory. The parasympathetic fibres (pelvic nerves) originate from sacral roots of S2-S4. Sexual dysfunction after pelvic surgery is most commonly related to injury of the autonomic pelvic nerves.

Psychological factors[6]

Psychological factors (history of sexual abuse, depression, anxiety, obsessive-compulsive disorders), sociocultural issues (beliefs regarding sexual activity) and interpersonal issues (partner availability, partner function, relationship with partner, communication with partner) affect sexual function in all age groups. With ageing, additional psychological stresses may emerge, particularly loss of fertility, interruption of the menstrual cycle, the start of postmenstrual changes and altered body image. Gender identity issues and personal uncertainties about sexuality can surface at any age.

Chronic pain and illness[20]

Sexual difficulties in chronic pain are frequent and wide-ranging. Prevalence rates of sexual difficulties consistently range from 50-78%. Difficulties occur particularly with arousal, positioning, anticipation of pain, and lowered confidence. The partner's fear of triggering pain through sexual activity is significant, and complete cessation of sexual activity is reported in up to 40% of chronic pain patients.

Assessing pain is an important part of assessing FSD. Obvious examples which could benefit directly from targeted treatment would include pain affecting the joints, and conditions causing abdominal tenderness. Chronic or recurrent headaches, fibromyalgia and chronic fatigue syndrome, together with many types of cancer and the medical or surgical consequences of their treatment, can also lead to FSD.

Musculogenic factors[11]

The pelvic floor muscles, in particular the levator ani and perineal membrane, participate in female sexual function and responsiveness. The levator ani muscles also modulate motor responses during orgasm as well as vaginal receptivity. When hypertonic, vaginismus can develop leading to sexual pain. When hypotonic (for instance, after difficult childbirth) vaginal hypo-anaesthesia and coital anorgasmia can develop.

Female sexual dysfunction with ageing[18]

Sexual dysfunction is highly prevalent in older women. Many women experience a change in their sexual function during the years immediately before and after menopause. As women age, genital blood flow decreases and a degree of clitoral and vulval neuropathy - with reduced touch sensitivity - is found with increasing age. Common complaints include a loss of desire, diminished responsiveness and low sexual arousal. Evaluation is difficult because the dysfunction is usually multifactorial, but recently a cultural shift has led to increased expectation of a satisfactory sex life in older age.

Medication

Medications for depression can significantly affect the female sexual response. Women receiving selective serotonin reuptake inhibitors (SSRIs) often complain of decreased desire, decreased arousal, decreased genital sensation, and difficulty achieving orgasm. Other medications which can affect female sexual function include:

- Antihistamines, sympathomimetic amines.
- Anticonvulsants.
- Metronidazole.
- Metoclopramide, cimetidine.
- Antihypertensives, diuretics, adrenergic antagonists (terazosin, doxazosin), beta-blockers, calcium-channel blockers, spironolactone.
- Alkylating agents, cyclophosphamide.
- Anticholinergics.
- Oral contraceptives.
- Hypnotics, sedatives.
- Alcohol.
- Anti-androgens, anti-oestrogens, tamoxifen, raloxifene, gonadotropin-releasing hormone analogues (leuprolide, goserelin).
- Analgesics, opiates.
- Drug dependency.

Under-researched groups

Most literature on FSD focuses on cases that fall within the DSM definitions, and, specifically, on pre-menopausal and postmenopausal women over the age of 18 years. There is a relative gap in information regarding younger patients and regarding women whose symptoms fall outside the accepted definitions of FSD. These groups are less likely to present in primary care and may have different expectations of their sexuality.

Adolescent girls and female sexual dysfunction[21]

Over half of adolescent girls are sexually active but research on FSD generally includes only women over 18 years of age. However, lack of sexual desire/arousal, sexual pain and anorgasmia are also likely to arise in adolescent girls, who are subject to many of the same factors that can affect older women. In girls these are more likely to be compounded by inexperience, lack of information and, often, lack of close partner trust. Sexually transmitted infections, condom allergies, congenital anomalies and abusive relationships should also be considered as possible underlying factors in this age group.

Persistent genital arousal disorder [22, 23]

Persistent genital arousal disorder is a condition of genital arousal in the absence of subjective sexual arousal. The physiological arousal can last hours or days, or occur constantly, and can arise through sexual or non-sexual stimuli. It does not remit after orgasm and is usually described by women as distressing, intrusive and unwanted. It is almost certainly under-reported, as it leads to confusion, shame and embarrassment, and a hesitation to seek help.

No cause or causes have been confirmed. Most literature consists only of case studies. A range of treatments, both pharmacological and psychological, has been tried successfully in isolated cases, including duloxetine and pregabalin. Identification of triggers, distraction techniques, and pelvic massage to decrease the pelvic floor tension have been attempted.

Risk factors [8]

Whilst FSD was previously thought to relate mainly to psychological and emotional factors, the associated risk factors are strikingly similar for women as for men. The factors associated with an increased risk of FSD include:

- Increasing age.
- Peripheral arterial disease or CVD.
- Metabolic syndrome.
- Neurological disease (stroke, Parkinson's disease, spinal cord injury).
- Endocrine failure, including premature ovarian failure.
- Hypertension.
- Smoking.
- Genital atrophy.
- Genital surgery.
- Endocrinopathies.
- Diabetes.
- Hyperprolactinaemia.
- Severe liver disease.
- Severe chronic kidney disease.
- Sexual abuse.
- Psychological factors, life stressors.
- Interpersonal, relationship disorders.
- Obesity, which may affect sexual function through insulin resistance, dyslipidaemia, psychological factors and biological factors (such as musculoskeletal problems).

Assessment of female sexual dysfunction [3, 18]

The problem

As in all areas of practice, history begins with the problem, its nature, history and impact and anything the woman thinks may relate to any change.

It is important to identify which type or types of FSD are present: if pain is present this may drive the history towards organic causes, but there may be other contributing factors. Careful, open questions regarding particular sexual practices or positions which particularly trigger pain are needed. It is helpful to ask the woman whether she feels that lack of foreplay, short or long duration of intercourse, or sexual problems in her partner could be a factor in her FSD.

Ascertain whether the woman has ever been happy with her sexual function and, if so, what she feels has changed and whether the FSD is situation-specific or person-specific. In men we ask about morning erections as a guide to the integrity of the erectile function. In women there is no easy parallel. A change in the frequency of erotic thoughts and the ability to achieve orgasm alone may offer a guide to underling changes in physiology and libido. These questions should be approached with some sensitivity, as women may not expect to be asked them.

General history

This should focus on identifying organic risk factors for FSD. Sexual dysfunction in women is commonly related to physiological changes resulting from underlying conditions which may be straightforward to treat. The focus may vary somewhat with the age of the patient but may include:

- Cardiovascular risk factors.
- Smoking and alcohol.
- Drugs and medication.
- Sexual health history.
- Features suggestive of endocrine or neurological disease.
- General fitness, exercise and diet.
- Menstrual and contraceptive history.
- Obstetric and gynaecological history.

Psychological and relationship history

Again, careful, open questioning is needed, in part guided by what the patient wishes to discuss. Issues such as relationship difficulties, gender identity and sexuality, differing partner expectations and previous sexual abuse may be very difficult for patients to disclose but, conversely, offering a comfortable opportunity for them to do so may be very helpful. Questioning needs to be open and permissive, for example, 'Have you ever had sex when you didn't feel able to say no?'

Other relevant psychological factors can include mental health disorders such as anxiety, depression, post-traumatic stress disorder (PTSD) and eating disorder (with associated altered body image). Emotional factors include bereavement, lack of privacy, difficulties with cultural or religious expectations, and the presence of babies and small children in the home.

Examination [3]

Clinical evaluation will vary with the history. Where pain is a feature it is essential to exclude infectious disease, tumours, polyps and diseases such as endometriosis and pelvic inflammatory disorders. Genital examination may reveal significant prolapse, vaginal atrophy or scarring from episiotomy repair, or evidence of vaginismus.

Basic laboratory testing is helpful to rule out treatable conditions, and includes FBC, lipid profiles, renal and liver function, blood glucose and TFTs. Follicle-stimulating hormone, luteinising hormone, oestrogens and testosterone should be measured to assess the functional integrity of the hypothalamic-pituitary-gonadal axis. Other investigations, including imaging, will be guided by symptoms, particularly in cases of sexual pain.

Several self-reported questionnaires are available to assess sexual dysfunction. The Female Sexual Function Index [24, 25] is the most commonly used validated questionnaire. It is a 19-item questionnaire. There are two other validated questionnaires that are available: the 22-item Brief Sexual Function Index and the 31-item Sexual Function Questionnaire.

Management of female sexual dysfunction [18, 26, 27]

The management of FSD will depend on the predominant underlying causes and there will often be several. Traditionally a psychological-behavioural approach was recommended. However, increased awareness that the risk factors for FSD mirror those for erectile dysfunction in men illustrates that organic disease plays a significant role. New-onset FSD, like erectile dysfunction, is a possible flag for metabolic and cardiovascular disease, although the list of other possible contributing factors is long.

Non-pharmacological approaches

Lifestyle advice [28]

Whatever the underlying causes, general advice on health and well-being, and fitness, and lifestyle advice aimed at promoting cardiovascular health, including advice on smoking and alcohol, are likely to be helpful. Modifiable risk factors include obesity, lack of physical activity, poor diet, metabolic syndrome, smoking and excessive alcohol consumption.

Relationship counselling [29]

Where relationship issues or differing expectations form a part of the history and presentation, even if they are not felt to be the 'core' trigger, relationship counselling or psychosexual counselling can be very helpful. This has been the traditional route for treatment of FSD in the past, although it may be increasingly difficult to access from primary care.

Cognitive behavioural therapy

Psychotherapy may help remove inhibitions and enhance interpersonal relations and sexual motivation levels. Behavioural therapy in women with vaginismus leads to improvements in overall sexual functioning.

The sexual function of women with chronic pain can be significantly enhanced by a cognitive behavioural treatment group delivered within an interdisciplinary rehabilitation pain programme [20].

Pelvic floor exercises [31]

The role of the pelvic floor in arousal and orgasm is significant and women can easily be taught simple pelvic floor exercises. Several studies report improvements in desire, arousal, lubrication, orgasm and satisfaction with sex. Pelvic floor exercise is also helpful for postpartum FSD.

Medical devices

The Eros Clitoral Therapy Device is a handheld medical device approved in the USA for sexual arousal and orgasmic disorders in women. It seems to be beneficial in women with difficulties with sexual arousal.

Pharmacological approaches to female sexual dysfunction

A number of different drugs are used to treat FSD but in the UK none is currently licensed for this indication. Flibanserin is now licensed in the USA. Many primary care physicians, whilst familiar with prescribing and monitoring HRT in postmenopausal woman, will feel uncomfortable with off-label prescribing of medications aimed at treating FSD.

Oestrogens [27]

Oestrogens are the most commonly used medications for the treatment of FSD, especially in perimenopausal and postmenopausal women. There is good correlation between decreasing levels and sexual function. Oestrogens are available as oral tablets, dermal patches, vaginal pessaries, implants, creams and jellies. Irrespective of administration route, oestrogen improves dyspareunia and vaginal pH. Oestrogen in postmenopausal women improves arousal, clitoral and vaginal sensitivity, lubrication and libido. Topical (vaginal) oestrogen improves vaginal dryness and irritation.

It is important to remember that replacement therapy with oestrogen (and progestogen) carries an increased coronary heart disease, stroke, thrombosis and breast cancer risk.

Tibolone [27]

Tibolone is a synthetic steroid commonly used for the treatment of menopausal symptoms, including diminished vaginal lubrication. Tibolone (2.5 mg) treatment has been found to improve both desire and overall sexual function in postmenopausal women with FSD. This effectiveness may be because of tibolone's combined oestrogenic and androgenic properties.

Testosterone [7, 32, 33]

Androgen levels in women decrease with age. Testosterone can increase clitoral sensitivity and sexual arousal and is one of the most frequently prescribed (off-label) medications for women with sexual interest/arousal disorder. However, its normal role in women is still not clear. Although its use in FSD seems logical based on its efficacy in hypogonadal men, female libido does not follow an exact parallel. Moreover, normal circulating testosterone levels in men are around ten times those of women, levels one could not attain in a woman without serious risks and side-effects. A further complication is that serum levels of testosterone may vary through the day, and a single measurement may not always be an accurate measure of circulating levels.

- **Pre-menopausal women**: published literature on testosterone use in pre-menopausal women does not support a simple correlation of low libido with low testosterone levels, nor does it consistently show an improvement with the addition of testosterone. Patients with polycystic ovary syndrome who have elevated testosterone levels, do not show consistent increase in libido. The beneficial effects of testosterone in FSD have been observed, generally, with relatively high doses. Most studies report a slight increase in sexual arousal in women treated with testosterone if levels of testosterone reach 80-150 ng/dL. These relatively high levels, over time, may result in masculinisation with hirsutism, clitoral enlargement, deepening of voice, and hair loss.
- **Postmenopausal women**: postmenopausal women with decreased sexual desire may be candidates for testosterone therapy, although treatment without concomitant oestrogen therapy has not been evaluated. When evaluating a woman for testosterone therapy, recommendations are to rule out causes not related to testosterone levels (eg, physical and psychosocial factors, medications) and to ensure that there is a physiological cause for reduced testosterone levels (eg, ovarian failure). Laboratory testing of testosterone levels should be used only to monitor for supraphysiological levels before and during therapy, not to diagnose testosterone insufficiency. Monitoring should also include subjective assessments of sexual response, desire and satisfaction as well as evaluation for potential adverse effects.

Transdermal testosterone patches and topical gels or creams are preferred over oral products because of first-pass hepatic effects documented with oral formulations. Testosterone products formulated for men have a risk of excessive dosing. Testosterone therapy is contra-indicated in women with breast or uterine cancer or in those with CVD or liver disease. It should be administered at the lowest dose for the shortest time that meets treatment goals. Counselling regarding the potential risks and benefits should be provided before initiating therapy.

Other hormones [9]

- There is no evidence to support the use of progesterone for FSD.
- Treating hyperprolactinaemia may improve FSD.
- There is no evidence to support the use of oxytocin in FSD.

Flibanserin [34, 35]

Flibanserin is a centrally acting drug which activates 5-HT1A receptors in the prefrontal cortex, increasing dopamine and adrenaline (norepinephrine) levels and decreasing serotonin levels. It has been described as a norepinephrine-dopamine disinhibitor (NDDI). Dopamine and norepinephrine are both involved in mediating sexual excitement, and serotonin is involved in sexual inhibition. Flibanserin is licensed for use for hypoactive sexual desire in pre-menopausal women in the USA and has attracted much press attention as 'the female Viagra®'. Women taking it are advised not to drink grapefruit juice and not to consume alcohol.

The manufacturers state that flibanserin increases the frequency of satisfying sexual events, and the intensity of sexual desire, but this has been controversial. A review of eight studies (including 5,914 women) suggested that treatment with flibanserin, on average, resulted in one-half additional satisfactory sexual event per month over placebo, while significantly increasing the risk of dizziness, somnolence, nausea and fatigue. Overall, the quality of the evidence was graded as very low.

Phosphodiesterase type 5 inhibitors [27, 36]

The introduction of oral phosphodiesterase type 5 (PDE-5) inhibitors revolutionised the treatment of erectile dysfunction in men but they are not licensed for use in women.

The mechanism of clitoral engorgement differs from that in the penis in that there is no obstructive process enhancing tumescence - the clitoris is engorged by increased blood flow only. In smooth muscle cells, nitric oxide (NO) activates guanylate cyclase, which converts guanosine triphosphate into cyclic guanosine monophospate (cGMP). This promotes vasodilatation and increases blood flow in genital organs. PDE-5 inhibitors enhance production of guanosine monophosphate. PDE-5 is expressed in vaginal, clitoral and labial smooth muscles.

Early trials suggested that sildenafil improved the ability to achieve orgasm and arousal and could significantly improve clitoral blood flow in postmenopausal women with orgasmic dysfunction, although evidence has been mixed. A 2016 systematic review suggested that the use of PDE-5s resulted in significant improvements in sexual function compared with placebo [37]. Adverse events include headache, and flushing and changes in vision are common.

Bupropion [2]

Sexual dysfunction (including altered sexual desire and orgasmic dysfunction) is a relatively common side-effect of antidepressant medication. For women with antidepressant-induced sexual dysfunction, bupropion at higher doses (150 mg bd) appears beneficial.

Phentolamine and yohimbine[27]

Phentolamine and yohimbine are vasodilators (alpha-adrenoceptor antagonists) sometimes used to treat FSD. They produce vasodilatation by relaxing smooth muscle.

- Phentolamine has been shown to increase self-reported lubrication and sexual arousal.
- Trials of yohimbine have failed to show any improvement in FSD. A small trial combining yohimbine with L-arginine glutamate produced objective blood flow changes but no significant subjective difference in arousal. Despite a lack of good-quality evidence, yohimbine (available as a food supplement) is widely marketed as a sexual performance enhancer[38].

Other agents[27]

Several other drugs have been examined to establish their possible role in treating FSD, although there is yet limited evidence for most:

- Prostaglandin E1 (PGE1) causes smooth muscle relaxation in the vaginal, and uterine, as well as penile, smooth muscle. A synthetic PGE1, topical alprostadil, has displayed positive results for the treatment of FSD, although overall the evidence is mixed.
- Vasoactive intestinal peptide (VIP) contributes to increased clitoral and vaginal blood flow when sexually stimulated. A cardiovascular agent, candoxatril, which enhances VIP levels, is a possible drug candidate for FSD, but research is still needed.
- Production of nitric oxide (NO) is essential in vascular relaxation. Some NO-donor creams are available, such as Sensua!®.
- L-arginine is the substrate in NO production. An L-arginine product, ArginMax®, has demonstrated positive results in the treatment of FSD in a small study, most effectively in pre-menopausal women. ArginMax® is a nutritional supplement containing extracts from ginseng, ginkgo, damamiana and arginine, with various vitamins and minerals.

Summary[3]

Sexual dysfunction in women is a common problem and can significantly affect relationships and quality of life. The problem is often multifactorial. Biological, psychological, sociocultural, and relationship factors may all play a role, and ageing is a significant contributing factor. The risk factors are similar to those for erectile dysfunction in men, and the condition may be a marker for CVD or endocrine disease.

Treatment depends on the underlying cause: Psychotherapy and other forms of counselling are useful for management of the psychological, relational and sociocultural factors impacting a woman's sexual function. Oestrogen is effective for the treatment of dyspareunia associated with menopause. Testosterone, with and without concomitant use of oestrogen, is associated with improvements in sexual function in postmenopausal women, although data on long-term risks are lacking. Bupropion can improve the adverse sexual effects associated with antidepressant use. Women experiencing difficulty with sexual arousal may be more responsive to PDE-5 inhibitors and prostaglandins.

Many other drugs have been assessed but data are limited and evidence is often mixed. No drugs are licensed in the UK for the treatment of FSD.

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